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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/696,081	10/29/2003	Sharon Liu	GP-302997-CD (003.0074)	5946

70422 7590 07/20/2010

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EXAMINER	
SILVER, DAVID	

ART UNIT	PAPER NUMBER
2128	

NOTIFICATION DATE	DELIVERY MODE
07/20/2010	ELECTRONIC

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte SHARON LIU and THOMAS R. BEWLEY

Appeal 2008-005706
Application 10/696,081
Technology Center 2100

Before JAMES D. THOMAS, HOWARD B. BLANKENSHIP, and JAY P. LUCAS, *Administrative Patent Judges*.

THOMAS, *Administrative Patent Judge*.

DECISION ON APPEAL[1]

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[1] The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, or for filing a request for rehearing, as recited in 37 C.F.R. § 41.52, begins to run from the "MAIL DATE" (paper delivery mode) or the "NOTIFICATION DATE" (electronic delivery mode) shown on the PTOL-90A cover letter attached to this decision.

STATEMENT OF THE CASE

This is an appeal under 35 U.S.C. § 134(a) from the Examiner's final rejection of claims 22 through 27, and 29. We have jurisdiction under 35 U.S.C. § 6 (b).

We affirm.

INVENTION

The present invention generally relates to a method for dynamic system parameter identification and, more particularly, to an adjoint-based gradient driven method for identifying nonlinear system dynamic parameters for automotive powertrain systems and subsystems. (Spec. 1, para. [0002]).

REPRESENTATIVE CLAIM

22. A method of identifying unknown model parameters of a non-linear dynamic system model of an automobile powertrain system having one or more system inputs, the method comprising:

determining a governing state equation for the powertrain system from the powertrain system model;

determining a cost function based at least in part on one or more powertrain system performance objectives;

determining a perturbation state equation from the governing state equation for the powertrain system;

determining an adjoint equation from the governing state equation for the powertrain system;

determining an adjoint identity from the governing state equation for the powertrain system;

determining a perturbation cost function based at least in part on the determined adjoint equation, the determined perturbation state equation, and the determined adjoint identity;

determining a gradient based at least in part on the determined adjoint equation;

supplying the governing state equation, the adjoint equation, and the perturbation cost function to a general purpose processor; and

causing the general purpose processor to iteratively determine changes in the perturbation cost function that result from incremental changes in arbitrarily chosen values of one or more of the unknown powertrain system model parameters to thereby identify the unknown powertrain system model parameters.

PRIOR ART AND EXAMINER'S REJECTION

The Examiner relies on the following references as evidence of unpatentability:

Kolmanovsky, *Evaluation of Turbocharger Power Assist System Using Optimal Control Techniques*, Society of Automotive Engineers, Inc, Article id 2000-01-0519, 1-11 (2000).

Bewley, *Adjoint and Riccati: Essential tools in the analysis and control of transitional and turbulent flow systems*, UC San Diego Galcit Seminar, slides 1-30, (2001).

Claims 22 through 27, and 29, constituting all claims on appeal, stand rejected under 35 U.S.C. § 103. As evidence of obviousness, the Examiner relies upon Bewley and Kolmanovsky.

CLAIM GROUPING

Based upon Appellants' arguments in the Appeal Brief, Appellants consider independent claim 22 as representative of all claims on appeal.

ISSUE

Did the Examiner err in finding that the combination of Bewley and Kolmanovsky teaches the step in representative independent claim 1 on appeal of determining a perturbation cost function based at least in part on the determined adjoint equation, the determined perturbation state equation, and the determined adjoint identity?

ANALYSIS

We refer to, rely on, and adopt the Examiner's findings and conclusions set forth in the Answer. Our discussions will be limited to the following points of emphasis.

The bottom of page 4 through the top half of page 5 of the Answer repeats Appellants' arguments with respect to Bewley. We agree with the following Examiner's responsive remarks at page 6 of the Answer:

> Attention is drawn to slide 18 which discloses that the perturbation equation (correlates to perturbation cost function), is N'(q)q'= O.

> It is seen that N'(q) is based on the state equation N(q) = f, additionally, the N'(q) portion is also based on the adjoint equation N'(q)*r =g, and the adjoint identity (<r,N'(q)q'>.omega2. = <N'(q)*r, q'>.omega2.+b. The only difference between the claimed invention and the Bewley reference is the form of the equation. To exemplify this, taking the function y = 2 + x and rewriting it as y - x = 2 it is seen that both of the functions are identical, but are merely taking a different form. Appellants have merely reworded the equation but the underlying claimed function remains identical to the one disclosed by Bewley. Because all of the functions are interrelated by "N(q)" (and "N'(q)", which is based on "N(q)"), they can be rewritten based on the two mathematical constructs established above, such that the perturbation equation is a function of the based at least in part on the determined adjoint equation, the determined perturbation state equation, and the determined adjoint identity.
>
> Although the Appellants choose to represent the equations in a different form, the underlying claimed function remains the same and is equivalent to the one that is disclosed by Bewley. In view of the above rationale the Appellants arguments are respectfully traversed.

(Ans. 6.)

Since no Reply Brief has been filed in this appeal, Appellants have not contested these views of the Examiner.

Appellants' arguments at the middle of page 10 of the Appeal Brief with respect to Kolmanovsky not teaching the features in our issue statement are equally misplaced. The Examiner has not relied upon this reference for the argued features in our issue statement set forth from representative claim 22 on appeal but has relied on Bewley. In a similar vein, Appellants have not challenged the combinability of Kolmanovsky with Bewley within 35

U.S.C. § 103 and have not challenged what the Examiner relies upon from Kolmanovsky in this combination.

Following Appellants' arguments in the paragraph bridging pages 10 and 11 of the Appeal Brief, it would appear that Appellants would agree with our conclusion that the combination of Bewley and Kolmanovsky would therefore teach the remaining clauses of representative claim 22 on appeal since we have found that the Examiner is correct that Bewley teaches the feature recited in our issue statement. Appellants have not separately contested the Examiner's reliance upon Bewley to teach the general-purpose processor and the iterative determining features at the end of this claim.

CONCLUSION AND DECISION

Appellants have not shown that the Examiner erred in finding that the combination of Bewley and Kolmanovsky teaches determining a perturbation cost function etc. as set forth in representative independent claim 22 on appeal. Therefore, the decision of the Examiner rejecting all claims on appeal, claims 22 through 27, and 29, under 35 U.S.C. § 103 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(iv).

AFFIRMED

rwk

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